

Report of the Coal Committee.

In submitting a summary of what has been done since our last Report, we shall commence with the

Tenasserim Provinces.

The annexed map will show at how many points coal has been found in the Tenasserim provinces, and at what points it is likely to prove of most utility. Coal has been found by Dr. Helfer at A, and B, two situations above the falls of the Great Tenasserim, at a distance of eight and nine days' journey, respectively, from the town of that name, but the quality is inferior, and the situation quite beyond the reach of any mode of conveyance to the coast.

Although the quality is excellent in a third situation in which the mineral has been found by Dr. Helfer at C, yet its distance from the coast is such as to render it of very doubtful utility on the Bengal side of the peninsula, whatever benefit it may eventually prove on the Gulph of Siam, as it seems to be situated beyond the boundary range of hills. Fortunately a still more recent discovery by a native, places us in possession of what would seem to be a most excellent coal, close to the banks of the Great Tenasserim river, and within twenty-nine miles of the town of Tenasserim.

Two reports have been addressed to the Commissioner of the Tenasserim provinces on the last mentioned coal, one by Lieut. Hutchinson, dated 6th May 1839; and the other, of a somewhat later date, by Dr. Helfer. From Lieut. Hutchinson's report, we learn that the position of this coal is $12^{\circ} 21' 30''$ N. lat., and about $99^{\circ} 5'$ E. long., or, by the course of the river, twenty-nine miles from the town of Tenasserim, and sixty-five from Mergui, although its direct distance from the coast is only twenty-eight miles. The coal is said by Lieut. Hutchinson to form a thick bed, covered by three feet of "*clay slate*," and from twenty to forty feet of *sand*, which is so *tenacious* as to require no propping where springs do not exist. In a subsequent correspondence on this subject, the coal is described as within ten feet of the surface, and from all we can learn, we have no doubt it might be worked like crop-coal, and clay ironstone, as described by Mr. Farey, i. e., merely by sinking pits down to the coal and raising it at once, and after undermining on all sides as much as can be done safely by the use of props, the latter may be withdrawn, and the roof allowed to fall in.

This coal burns with a bright flame, and answers admirably for

steam purposes. 50 pounds tried in the still furnace laboratory of the Honorable Company's Dispensary, afforded four gallons of distilled water, and left a residue of four pounds weight of ashes, cinders, and small coal that fell through the bars of the furnace during combustion.

Its specific gravity is 1.27

Composition,

Water,	9
Volatile matter,	46
Carbon,	40
Ash,	5
	100

The distance of this coal in a direct line from the coast being only twenty-eight miles, Lieut. Hutchinson proposed to construct a road, which he supposed would reduce the expense of delivery on the coast considerably. Boats of large draught it is said, may ascend the Tenasserim river at all seasons to Tenasserim town, within twenty-nine miles of the coal, and during the rainy season to the coal itself, so that nothing could be more favourable than the position of this coal for all purposes of local improvement, as well as for steam navigation to the eastward. Forty tons of this coal cost $5\frac{1}{2}$ annas per maund at Mergui, and 8 annas per maund in Calcutta. The Government have called upon Mr. Blundell, the Commissioner of the Tenasserim provinces, to provide 50,000 maunds; and have furnished a working party, consisting of persons accustomed to mining, for the purpose, and have intrusted the superintendence of the necessary operations to Lieutenant Hutchinson.

We have been informed by Captain Lloyd, I.N., that about one degree lower down the coast, coal has been found of very good quality on the *Senhea* river, but the Committee have no information on this head, although some progress had been made in raising a quantity, when the work was discontinued in consequence probably of the more favourable position of the coal near Tenasserim. The *Senhea* coal is situated, Capt. Lloyd thinks, about $11^{\circ} 22'$ N. lat., and $99^{\circ} 8'$ E. long. about forty miles up the river, the navigation of which is doubtful. It is however the most southern point at which coal has been hitherto found on the Malay coast.

A detached fragment of an inferior coal called Anthracite by some, has been found near Maulmain, latitude $16^{\circ} 30'$ N. thus indicating the presence of coal formations between the Tenasserim coal fields, 12° N. latitude, and Arracan 19° N. latitude, and holding out strong inducements to further search being instituted in that quarter.

Arracan.

The more we know of coal, the more are we impressed with the fact, that it never presents false indications of its presence. There is hardly an instance either in India or elsewhere of its appearing at all, that it does not do so under circumstances to render it in the highest degree important to Society; and although at first the quality and extent of the beds in any new district may be for a time doubtful, yet experience teaches us, that where these indications do not improve in proportion to the intelligence and enterprise directed to their complete development, the mineral is not true coal, but a substance, the peculiarity of which is easily detected, as the brown coal of English geologists. The samples of coal we received from different parts of the Arracan coast, were such as to leave no question whatever as to the beds from which they were taken belonging to the true coal formation.

Coal has been found composing a part of Oogadong, a small island opposite to the harbour of Kyak Phyo, in two situations not very far from each other. The sample supplied was much impregnated with pyrites, it was however a caking coal, belonging to the true coal measures. It would be a desirable object to try how far the Oogadong coal might answer for the reduction of Rambree iron ore, which is very abundant. Red Hill being said to be composed entirely of an ore that was formerly worked to some extent by the Burmese, a small quantity of the ore and coal might be sent to Calcutta for trial, and if the result proved satisfactory, trials on a larger scale might be repeated on the spot, where experiments of the kind must always be cheaper and more satisfactory than when made at a distance. Coal has also been found on Paget, or Adam's Island, south of the great island of Rambree. It has also been found in small seams in one of the Bolonga Islands, as well as near the beach at Sandoway; but the necessary information is wanting to enable us to conclude any thing from these indications, beyond the fact of the existence of coal, to a great extent, in the Arracan provinces.

The most promising bed yet found, is one that was brought to the notice of the Commissioner, Captain Bogle, by Lieut. Lumsden, who states that it was found about two years ago by persons employed in coal-finding by Captain Williams. This coal occurs at a place called Hoong, near the head of a river, which descends from a range of hills on the southern extremity of the island, falling into the Sandoway channel. Mr. Lumsden states that large boats may approach to the very spot where the coal is found. On visiting the spot, Mr. Lumsden

found “an irregular vein of coal, of about a foot in thickness, mixed with broken red sandstone, and on working below it, he came to a kind of *clay slate* and eventually to water.” Mr. Lumsden, however, states that he was obliged from fatigue to leave the work to a native, who in a few days brought to him 120 maunds of coal—a larger quantity than we should have supposed a native could procure in so short a time, under circumstances described by Mr. Lumsden. A sample of this coal, consisting of four or five maunds, was brought to Calcutta by Captain Bogle, and tried in the Laboratory of the Honorable Company’s Dispensary, and found to burn with a clear bright flame and very little smoke. The following are the results of its analysis :—

Specific gravity,	1.28
Inflammable matter,	40
Carbon,	54
Ferruginous ash,	6
	100

It is a free burning coal, giving out a strong heat, and would no doubt be found suitable to steam purposes, as it is quite free from the sulphureous impregnation which rendered the former samples of Arracan coal objectionable.

The want of more satisfactory information than we yet possess regarding Arracan coal is much to be regretted, as there is no part of India in which good coal mines could be attended with more advantage, whether we regard the situation on the coast, or the peculiar circumstances of the province itself. This district is chiefly known to Europeans by the mortality that took place there during the late war. Few are aware that within twenty miles of the town of Arracan, there is a fine elevated chain of mountains, extending parallel to the coast, and affording no doubt as fine a climate as any part of the world, although the coast itself is low, and like many similar tracts in the north of Italy, and south of Europe, unhealthy. Let good coal be once discovered in abundance in this fertile province, and the deadly effect of climate to persons exposed in miserable boats, or damp huts surrounded by swamps, will disappear, and the indolent streams become the track of steamers, perhaps to the very foot of the hills, which might thus become available as places of residence.

Sylhet.

Although the attention of the Coal Committee has been constantly directed to this quarter, the only result accomplished since the

last report, that can be said to be new, is the delivery of 10,000 maunds of Cherra coal at Goalparah, in Assam, at the rate of eight anas per maund,* after the attempt to supply that station during the rainy season with coal at any price from Burdwan had failed.

Three beds of coal, situated near the foot of the hills, have been brought to notice, but we have no information on the subject to enable us to decide whether these are new discoveries, or merely the bed alluded to in our last reports, as having been brought to notice some twenty-five years ago by Messrs. Jones and Stark. Without going into that question, we shall merely state all we know of the three beds now alluded to.

The first and most promising, is that of Byrung Poonjie,† situated near a village of that name, within about two miles of water carriage, and the ground such as to allow of the construction of a hackery road.

We know nothing of the circumstances of the bed, further than is stated by Mr. Landers, a practical gentleman, who has been appointed for the superintendence of coal mines in Sylhet and Assam, and who observes—

“ Byrung coal is of a soft quality, intermixed with stones three feet and a half high and varying in its thickness. The vein runs from east to west, and descends with the hill towards the south : to what extent this field may exist, it is impossible at present to say, the want of proper implements” (these have been since provided) “ prevented me from ascertaining ; a trial ought to be made by running galleries into the strata six or eight fathoms, at once to determine both height and quality, and also if it would admit of any outlay.” This coal has been tried, and appears to be likely to answer very well for steam, while it has the additional advantage of yielding excellent coke.

Not far distant from the Byrung bed, there is another at a place called Chiela, or Chaila, which varies from one to three feet in thickness. This however is said to be an inferior coal.

Major Lister, to whom we are indebted for the first and almost the only information we have had regarding the two foregoing coals, states, that Mr. Inglis, of Cuttack, has found a coal bed above Chaila, at a village called Mustuk, about 1,500 or 2,000 feet above the plains,

* This having been done under the direction of the Marine Board, the Committee have documents on the subject.

† Communication has been received from Major Lister since the annexed remarks were written, stating that Mr. Landers has traced the Byrung Poonjie bed for two miles to the westward without finding more on an average than a foot of good coal ; hence Major Lister and Mr. Landers conclude the Byrung bed is not workable.

and within such distance of water carriage as to enable a porter to deliver five burdens daily from the pit into boats. Mr. Inglis is of opinion that this coal is quite as good as that of Cherra,* and Major Lister observes that it looks so, though the quality is different, being blacker, with an exceedingly high polish; it burns considerably longer than Cherra coal, and cakes less, but is heavier, and yields more ashes.

The value of these, as well as similar indications alluded to in our last report, is still doubtful, and must remain so until the whole tract along the base of the Kasyah hills be submitted to a geological survey. For the present season, if the Government require coal from this quarter, we agree with Major Lister in thinking it will be necessary to confine our exertions exclusively to the Cherra bed. This, as is well known, is situated on the summit of a mountain, nearly 5,000 feet above the sea, and at such a distance from navigable rivers as to render it a day's work for each cooly to deliver a maund, or about 80 pounds, of coal from the pit into a boat.

The only way of lessening this inconvenience would be by improving the conveyance, by an improvement of the road. Above and below the steepest portion of the descent would admit of bullocks being used, as stated p. 48 in our former report. Instead of porters for the steeper or middle portion of the journey, it has been proposed to construct a slide, as suggested by the late Colonel Watson. The improvement of the road between Cherra and the plains would be a work of some public utility, as it would be the means of facilitating ingress and egress to and from the mountain plateau, it would therefore be a very desirable object, independent of the coal. The value of a slide however, would depend entirely on our success in finding as good a coal below, as that which is above—an uncertainty which ought to be at once removed by a perfect geological survey, as already suggested.

Some difference of opinion prevails as to the best way of transmitting Sylhet coal to the great lines of inland navigation on the Ganges; some contending that it would be necessary in the first instance to send them a distance of 300 miles to Calcutta, and from thence back to Surda, and other depôts on the Ganges;—experience is the only way of settling questions of this nature, and measures are now in progress for the delivery of the largest possible quantity—10 or 15,000 maunds of Cherra Poonji coal—in Calcutta, with the least

* A cargo of it having recently arrived in Calcutta it is now (4th May, 1840) under trial on a large scale, and promises to turn out very favourably.

possible delay, compatible with the fair trial of the experiment. The Kasyahs, on whom the burden of the experiment will literally fall, though a fine athletic race, are little accustomed to labour; Major Lister may therefore have some difficulty at first in reconciling a sufficient number of them to a continued effort, the object and importance of which, they can so little understand.

It is necessary to take the quality of coal into account before any particular price per maund can be regarded as dear or cheap; it is quite incredible to what degree a slight difference in quality affects the value of coal, for steam vessels. It has been found by means of the only trial instituted between Cherra and other coals now in use, that 9 maunds are equal to 14 of Burdwan coal. Let us suppose (without laying too much stress on a single trial of a few maunds) the proportionate value of the two coals to be ascertained as above; 100 maunds of Cherra would not only as a fuel be equal to 155.5 of Burdwan, but we should also have to debit to the latter the value of 55.5 maunds stowage or tonnage, which might amount to more than the entire value of the coal consumed.

The Cherra Poonji coal forms the cap of a hill, from which each cooly may help himself to his load almost without the aid of mining, so that the carriage, 4 annas per maund from the pit to the nearest navigable river, though high, may be said to include the expense of winning, or bringing coal to the surface. Could any of the following indications of coal lower down, towards the foot of the mountain, be found to yield good supplies, a portion, or nearly the whole of this large item of expense might be saved, viz. 1. Tipperah hills, in a small river which descends from a hill with a Musulman Doorga called Orpeen, on its summit; 2. Opposite to Jalalgur, in Lowr; 3. Patli river, and several streams descending from the Garrow mountains; 4. Near Susung; 5. On the top of one of the lower ranges at Lowr, and in the rivers of Lowr; 6. In the Dysung and its tributaries; 7. Between Panalick and Bansekora; 8. Barachara; (vide reports of the Coal Committee, pp. 49, 50, 51) to which we have now added Byrung Poonjie, Chaila, and Mustuk, (vide para. 13, 14, and 15, of the present report.)

The rate of boat-hire from the Sylhet district, along the verge of which the coal formation lies, to Surdah on the Ganges, one of the principal depôts for the supply of steamers, is stated by Mr. H. Inglis to be 21 rupees per 100 maunds. In regard to water conveyance, Sylhet has the advantage of any of the coal districts to the westward, while its proximity to the great rivers of Bengal gives it an advantage over the Assam coal districts; and thus while

any mines that might be established in Sylhet would hardly be affected in value by similar establishments in any other part of India, there is hardly a district from Arracan to Palamow the value of whose mines would not seriously be affected by any subsequent discovery of coal in Sylhet. In like manner any collieries that might be established in Assam, or other remote provinces, would be entirely superseded in the Bengal market by any new discoveries of good beds of coal that might be made in the Sylhet district. It is for this reason that we have laid peculiar stress on the importance of a thorough investigation of the coal measures along the base of the Kasyah and Garrow hills, since upon this, and the manner in which it is conducted, must depend in some measure the prudence of investing capital in more distant coal districts.

Surdah is within a few miles of Bogwangola, one of the greatest marts in Bengal for grains of every kind, goor, oil, ghee, and the chief articles of native consumption. Being situated in the centre of Bengal, near the junction of all the principal rivers, as the Bhau-garutty, the Ganges, and Bramputra, it is naturally the centre of internal commerce, and consequently the greatest mart for boats in Bengal. Surdah, or some situation in that neighbourhood, appears therefore to be the situation at which a General Depôt ought to be formed. We have consulted J. W. Grant, Esq. of the Civil Service, who had been long commercial resident at Maldah, and Major Carter, who has been for a large portion of his life in the Bengal Commissariat, and the experience of both these gentlemen goes to prove that at Bogwangola and Jellinghee, boats for the transmission of coal from Surdah to any part of Bengal or the Upper Provinces may be had to any amount of tonnage likely to be required.

The distance from Cherra Poonji to Calcutta by water, is about the same as to Surdah; while the latter is one hundred and fifty miles nearer to Rajmehal, and other depôts to the eastward.

Major Carter states that the voyage from Calcutta to Cuttack in an empty boat should not take above 24 days, and returning laden, about the same period, as the stream would be favourable to Dacca, and from thence in the tide way. "Assuming however, two months as the time necessary to complete a voyage, including loading and unloading, it strikes me," says Major Carter, "2½ annas per maund should nearly cover the carriage, and below I give the

grounds of my opinion. A thousand maund boat can be hired at per			
Mensem	30	0	0
“ 10 Dandies at 3 Rupees each,.....	30	0	0
“ 1 Manji at 4 Rupees,	4	0	0
			0
			2
			128 0 0

This boat should carry 800 maunds, which just gives 2 annas $6\frac{1}{2}$ pice per maund, so that at this rate Cherra coal ought to be delivered in Calcutta at 7 annas per maund; Major Carter therefore expresses his surprise that an offer recently made by the Marine Board, of 9 annas for Cherra coal, had not been taken up, and suggests that if boats of 2 or 3000 maunds, such as are used for bringing wood from the Sunderbunds, were employed as far as the rivers would admit, the carriage would be still lower.

The readiness with which boats may be had for any regular trade, may be imagined by the following observation of Major Carter:—
“ Hundreds of large boats frequent the Sunderbunds, nearly as far as Dacca, in search of cargoes of rice and dhan, the worth very little more in ordinary years than coal, and the latter scarcely one half as valuable; they do not find their cargoes at one place, or belonging to one person, but attend the banks, and purchase in whatever quantities the people bring to the market, often only a few seers, and seldom exceeding a few maunds.”

The Commissariat regulations, and general custom of paying boat-hire on a computed distance instead of the time actually employed, might in the first instance militate against the economy of any arrangement for hiring boats, says Major Carter; but if a few boats were purchased or built at Dacca or in the Sunderbunds, and manned by a private individual, the result would prove the correctness of these calculations. A good boat could be built for 500 rupees, and in six trips, at the above rate, would yield 300 rupees, leaving 60 for casual repairs, this would repay itself in less than two years; but a boat is expected to last seven or eight.

Cuttack.

About ten years ago a specimen of coal found in the Cuttack district was sent to the Asiatic Society, probably with some particulars which do not appear to have been noted in the proceedings; the circumstance was however suggested to the Committee by Captain Jenkins, in 1837, and soon after Lieut. Kittoe, then with his regi-

ment at Cuttack, obtained a specimen, together with some particulars which he communicated to the Committee; on which he was requested to visit the spot, when he collected the following particulars. Half a mile from the Fort of *Talcheer** coal seams are exposed along the banks of a small *Nulla* called *Belajooree* (at a spot where workmen employed by Mr. G. Becher, had a few years before extracted some specimens of coal). Mr. Kittoe formed an excavation to the depth of 15 feet, in which he found at a depth of 13 feet a bed of "good glistening coal," 1 foot to 1½ foot thick, reposing beneath ten feet of "*shingle*" and two beds of shale and blue clay, each 1½ foot thick. The latter, as well as a grey rock beneath the coal, both containing fossil plants.

Mr. Kittoe states, that a native contractor offered, in the event of coal being raised at *Talcheer*, to convey it down the *Bramenee* river to *Himsuagola*, on the coast, where large sloops may anchor, at four annas per maund; but Mr. Beetson, the contractor for the transport of salt from thence to *Calcutta*, was of opinion, that two annas per maund at the utmost would be sufficient. From the coast to *Calcutta* the transport of coal would be the same as that of salt.†

The next coal to which Mr. Kittoe by his guide was conducted, is a few miles higher up the *Bramenee*, and at a distance of sixteen or eighteen miles from that stream, so that its conveyance would be considerably more expensive. The coal is here exposed for a mile on either side of a *nulla* called *Sungurra*, a tributary of the *Bramenee*, averaging in height from five to fifteen feet above the sand. The country is said to be level from the coal to the bank of the *Bramenee*, so as to afford every facility for the construction of either a road or a canal. Iron ore is found in great abundance throughout both these coal districts, and the ore is smelted to some extent, and by the same process as that which prevails in other parts of India.

Such is the substance of Mr. Kittoe's Report.‡ The specimens of coal furnished were not of good quality. Three specimens of *Talcheer* coal examined at the Mint, afforded the following average results:—

Specific gravity,	1.3610
Volatile matter,.. .. .	39 0
Carbon,	44 1
Earthy matter,.. .. .	15 10
	100 0

* *Talcheer* is a town on the *Bramenee* river, 140 miles from the coast.

† At present there are three contracts for the conveyance of salt from *Hunsew* to *Calcutta*; the rates are 18 Rs., 17 Rs. 8 annas, and 17 Rs. per 100 maunds.

‡ Vide *Asiatic Journal* of 1839, pp. 137—144.

Talcheer and Hingolar may be regarded, we think, without much doubt, as an extensive and valuable coal field. The workable beds will probably be found to be some distance from the surface at the spots visited by Mr. Kittoe, but the district appears to have been subject to so much local disturbance, that more favorable positions for coal mines may be expected, when the country has been properly examined.

Since the above remarks were written, the Committee have received a communication from Mr. Mills, the Commissioner of Cuttack, enclosing a report from Mr. Beetson, whom he deputed on 22nd February last, at the instigation of Mr. Smith, the President of the Coal Committee, in order to procure further information on the subject. Mr. Beetson reports, that "the samples laid before the Committee by Lieut. Kittoe, were far inferior to those I have now brought with me. The latter are equal to the best Burdwan; but to satisfy the Committee as to its description and quality, if Government will pay the expenses, which will amount to a mere trifle, I shall be happy to undertake the delivery of one or two hundred maunds in Calcutta by next December." Mr. Mills observes that the specimens, as far as he and other gentlemen at the station are able to judge, are so very good, that he authorized Mr. Beetson to procure 100 maunds for trial in Calcutta. This coal is derived from the second, or more distant coal field visited by Mr. Kittoe. The locality in which the coal occurs is, according to Mr. Beetson, called *Gopal Pushad*, and the nullah by which it is laid bare, *Sangra*, which corresponds with Mr. Kittoe's name *Sungurra*. Mr. Beetson states, that the distance from Gopal Pushad to Talcheergur is from fourteen to sixteen miles, and recommends that the coal be carted by buffaloes (the common draught cattle of the country) to Talcheergur. From Talcheer the coal could then be conveyed in ten or twelve maund boats to Kumalung, six miles below Talcheergur, where it should remain till the setting in of the rains, and from thence it may be conveyed for six months of the year in from 100 to 300 maund boats to Hunsuah on the coast, where it would be available for sea-going steamers at from three to four annas per maund. From Hunsuah, Mr. Beetson would undertake to convey the coal to Calcutta at 18 Rupees per 100 maunds, and indeed he thinks he could supply it to the Calcutta market at six annas per maund, including every expense.

Adji.

Since our last report, little has been elicited regarding the northern boundary of the Burdwan coal field, where the beds advance

towards the Adji river. Mr. Erskine in reply to a circular from the the Committee, dated October, 1838, recapitulates the different places at which coal has been found. Mammudpore is the most eastern situation. The pits are here four or five miles from Seedporeghat. The mineral is better to the westward at Parihorpore, about ten or twelve miles above Seedpore. Seedpore is eighteen miles from Cutwa or Culna on the Hooghly, and the river is pretty open during the rains for boats of 400 maunds burden from Maulyghat to Cutwa, a distance of forty miles. The upper portion of the river rises and falls suddenly, so as to render it difficult to manage a larger boat than 200 maunds. Mr. Erskine observes, that considering the difficulty of the Adji navigation, and the scarcity of boats at present, and also the high price that it would be necessary to offer to boatmen to induce them at first to undertake the carriage of coals; he does not think the coal could be delivered at Cutwa under four annas per maund. Should the regularity of the employment induce people to build more boats (as has been the case on the Damooda,) prices might fall to about 3 annas per maund. Adji coals are now used for the Dhoba Sugar Works to the extent of 10 or 15,000 maunds per annum.

Rajmahal.

When our last report were written, coal was known to exist in two situations only in the Rajmahal hills; namely, Sicrigully and Hurrah. In April 1838, Major Forbes was informed by Mr. James Pontet that he had found a bed of coal in the Rajmahal hills, on the banks of a nulla called the Bramenee, sixteen miles distant from the water carriage during the rains, about thirty miles west of Moorshedabad, and nearly in the line of the canal proposed by Major Forbes. A specimen of this coal afforded the following on analysis:—

Specific gravity,	..	..	..	..	1.370
Volatile matter,	..	..	..	..	42 0
Carbon,	..	..	..	..	44 8
Earthy matter,	..	..	..	..	13 2

100

A sample consisting of a few maunds furnished by Mr. Pontet sometime before to Mr. Scott, the commander of the Jumna steam vessel, also proved of favourable quality. Mr. Pontet having been desirous of procuring the means of extending his observation, these were provided, and on the 20th June he dispatched ten bags of coal to Calcutta, this also proved favorable; but a subsequent dispatch of 400 maunds consisted of shale and inferior coal. In explanation

of this last unfortunate circumstance, Mr. Pontet stated that the necessary aid did not reach him till the rains had set in, when the place being unhealthy, he was obliged to leave the raising and dispatch of the coal to inexperienced natives.

The following is an extract from Mr. Pontet's letter, in which he describes the operations in which he was engaged—"After the first vein of coal, we came upon a hard black stone, and finding the operation of boring through it so very tedious, I took upon myself to select a spot for a shaft, and procured well-diggers, and stone-cutters, who have been for the last two months at work, at present to all appearance with satisfactory prospects, as one of the stone-cutters who opened a shaft at Burdwan says this mine bears some resemblance to it. I am induced to persevere a few feet more, in hopes of coming to a useful vein. The first twenty-three feet of soil is red and black earth mixed with kunkur, and under that, to a depth of forty feet, are thirteen different *strata*, three of coal, and the rest various kinds of stone." Mr. Pontet transmitted to the Committee specimens of all the different beds passed through, which are remarkably characteristic of the true coal measures; and of eleven different beds passed through in the last seventeen feet of the excavation, three were coal of good quality, but too thin for working, and in the shale we observed excellent specimens of *Vertabrea Indica*, one of the few abundant fossils of the Burdwan beds that happens to have received a name.

The excavation was formed on the N.W. side of the Bramenee nulla; but Mr. Pontet states that he traced the coal a mile S.W. of the Bramenee river, from which he concludes that the Burdwan and Rajmahal beds are connected.

Soan River.

In a letter from Mr. Ravenshaw, Officiating Commissioner of Patna, to the Government of Bengal dated 6th January last, that gentleman states that a Cazee had found a bed of coal at a place called Chupree, four miles from the Soan, near its junction with the Koila, and estimated the expense of delivering coal from this bed to Dinapore to be five and a half annas per maund. On this information 300 rupees were advanced to the Cazee to enable him to commence operations; but after extracting 100 maunds, precisely similar to Palamow coal, the bed assumed a slaty character, and the Cazee abandoned his operations. If the Cazee's statement regarding the existence of coal so near the Soan be correct, the circumstances under which it occurs ought to be fully investigated.

Palamow.

Mr. Tytler, an engineer employed under the Controller of Steamers, having been deputed, under the authority of the Marine Board, to Palamow, describes a bed of coal six feet thick, exposed to a great extent on the banks of the Amanath river, where Mr. Homfray a short time before could only find a $3\frac{1}{2}$ feet bed, so interrupted by ravines as to render the field very limited. There is however evidence enough in the reports of Major Sage, and Mr. Tytler, as well as in the information furnished to Mr. Ravenshaw, the Commissioner of Patna, to show that coal is here abundant enough, the only doubt is as to its quality. The samples of Palamow coal that we have seen have been vitiated by the inexperience of the miners with an intermixture of shale, so as to render them unfit for trial. Major Sage, Executive Engineer, Dinapore, states that he had formerly been in the habit of receiving supplies of coal from Palamow, which he considered a good and useful fuel. We have no doubt that a good coal may be procurable in Palamow, but such samples as have been hitherto sent to Calcutta for trial have been inferior, partly no doubt from their having been ill chosen from the numerous beds that seem to occur in that district. Major Sage found the following results from comparative experiments instituted between Palamow and Burdwan coal, from which it would appear that the former has the advantage in point of quality.

	<i>Palamow.</i>		<i>Burdwan.</i>	
Coke,	46	2	46	2
Volatile matter, ...	47	0	40	0
Earthy matter, ..	6	8	13	8
	<hr/>		<hr/>	
	100	0	100	0

In experiments of this kind on a small scale, every thing depends on the specimens selected for comparison. The Burdwan coal varies in quality in different mines, just as Palamow coal would vary if mines were once fairly established in that district.

The best Burdwan coal we can induce the contractor who supplies the laboratory of the Honorable Company's Dispensary to furnish, affords 25 per cent. of ashes, but the kind used on board steamers is said to be very superior to this, and the Ranygunge variety with which other coals are compared, is the best in Burdwan. Much judgment is therefore necessary in selecting samples for trial from new coal districts, when the object is to compare them with Burdwan coal. What-

ever coal it has been customary to use will always have the advantage of a new coal in such trials, in as much as the form of the furnace, and the manner of keeping up the supply will be such as are suited to the old coal, while the necessary experience is wanting with regard to the most favourable circumstances for burning the new.

If the draught of the furnace be too great for the coal, the fire will burn down too rapidly, and the coal will be wasted in an unnecessary quantity; and if not sufficient, the fire will burn too slowly, and the stoker perhaps accustomed to throw in fresh fuel at certain intervals will keep the fire choked, so as to require more frequent stoking than necessary, and (as Colonel Presgrave remarked on the late trial of Palamow coal) every time the door is opened for this purpose, a volume of cold air enters, the effect of which is to lower the steam.

On board the Jumna steamer, 13th March last, three samples of Palamow coal were tried, one furnished to Mr. Ravenshaw by Cazee Mohumdee, mixed however with Chupree coal, and the other two from Mr. Tytler; the first seemed to answer best, though evidently raised without judgment, and mixed with shale. The faults of this compared with the best Burdwan coal were, that it required a much larger quantity to keep up steam, and that it ran into slags or clinkers, which choked the bars of the furnace. This last effect may have been owing to the coal being mixed,* and perhaps would not have taken place had the bars of the furnace been wider apart. Mr. Tytler's sample from Lower Miral appeared to burn very freely, but compared with the best Burdwan coal, twice the quantity was required to keep up steam. On a third sample from Upper Miral being tried, it was found that even with an excessive consumption of the fuel, it could not keep the engine at full work. The value of these experiments will however depend on two circumstances, namely, whether the samples tried were the best that could be chosen, and whether the furnaces of the Jumna are as well suited to the nature of the coal as any that could be constructed.

Mr. Ravenshaw thinks he can procure a contract for the supply of Palamow coal at Dinapore for six annas per maund, it would therefore be of some importance to have the question of its quality fairly set at rest.

* A small quantity of carbonate of lime or soda would have the effect of rendering the earthy parts of coal fusible. We think in another trial of Mr. Ravenshaw's mixed coal we could easily select the pieces which formed slags from the general mass, as they are covered on the surface with an efflorescence of soda. We think they belong to Singra, one of the Palamow beds, and the peculiarity is probably very local.

Assam.

A report having been furnished on the subject of the Assam coal beds since the last general reports of the Committee were written,* there is little to say on the subject. Lieutenant Brodie, principal assistant to the Commissioner, found coal of good quality about a year ago in a very favourable position on the Disung river, a specimen of which was forwarded to the Committee in July last, and found to afford—

Specific gravity,	1.3
Inflammable matter,.. .. .	40
Carbon,	55
Earthy matter,	5
	100

We believe the Assam Tea Company are already about to open a colliery in this situation, with the intention of keeping a depôt supplied from it at Dikoo Mookh, on the main river.

Mr. Brodie had before found two and a half feet bed of coal about three and a quarter of a mile above the falls of the Jumna. A boat on average would reach the falls from Gowahattee in twenty days, and return in ten. Some years ago coal was raised by Mr. Bruce, under orders of the late Mr. Scott, from beds near the banks of the *Suffry*, a tributary of the Disung; on trial *this proved to be the best coal ever found in India*, but the situation was inconvenient, the *Suffry* being unnavigable at all seasons, and a small ridge of hills would render the formation of a hackery road difficult. In February 1838, Captain Jenkins found two beds of coal, one of them 100 yards in length, and eight feet in thickness, projecting from the banks of the Disung river about a mile above the village of Boorhath; the other situated in rising ground, about a quarter of a mile from the first, was exposed for 200 yards in length, and numerous small springs of petroleum emerged from beneath it. From these Captain Jenkins' servants collected about five seers of petroleum in a few minutes. The Disung is navigable for six months of the year.

Beds of coal were also observed by Captain Jenkins at Jeypoor, about ten miles east of Boorhath, on the Bora Dihing river, a quantity of which was raised by Captain Hannay and sent to Calcutta, but not approved of. Like all similar experiments on the quality of coal the results proved little, especially as we now understand the Assam

* Published in Journal As. Soc. 1838, pp. 948, 959.

Tea Company have established a colliery in this situation,* in addition to the one already alluded to on the Disung; thus two principal depôts will be supplied on the main river at Debru and Dikoo, from distinct coal districts capable, if necessary, of supplying other depôts along the whole line of the Bramaputra.

An excellent coal was found by Lieut. Bigg and Mr. Griffith on the Numroop river, in Upper Assam, and Mr. Bigg states that immediately opposite the village on the west of the river is another range of hills similar to those in which the coal is found; in these they found eight or ten springs of petroleum.

Nerbudda.

With regard to the Nerbudda coal, the Committee have received no communications since their last reports were laid before Government, but it appears to have been since tried at Bombay, and found to be of very excellent quality.

Specimens of coal were found by Captain Burnes during his mission to Cabul in 1838, in the following districts, viz., 1, Shukurdura, near Kala Bagh, where it occurs in a hill two miles south of the village, and other situations in the neighbourhood; distance from the Indus about 15 miles. 2, near Muckud, locality doubtful. 3, fifteen miles SSE. of Cabul near Moozye, in the vicinity of copper mines. 4, Jamoo, in the Punjab, near the Chenab, where it would be as valuable as if found on the Indus. 5, between Tak on Kaneegoorum, NW. of Dera Imael Khan, $1\frac{1}{2}$ coss East of the small village of Sungarkhyle, in the neighbourhood of the Indus, where the country is said to be poor, and labour cheap. Captain Wade, Political Agent at Lodiana, also found specimens of coal in the Maundi Hills north of the Sutlej: more recently we believe Mr. W. Jameson, whose observations will be of peculiar value in every point of view, has found extensive tracts belonging to the coal formation, approaching as near to the Indus as he had been able at the time he wrote to carry his inquiries.

(*Signed*) J. M'CLELLAND,

4th April, 1840.

*Assistant Surgeon,
Secretary Coal Committee.*

* As well another at the place.